## Remarks

Claims 1-19, 22-29 and 31 are pending in this application. In an Office Action dated July 11, 2005, the Examiner rejected claims 1-8, 10-13, and 31 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,132,306 to Trompower (henceforth, Trompower) in view of U.S. Patent No. 6,301,238 to Hagerman (henceforth, Hagerman). The Examiner rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Trompower and Hagerman in further view of U.S. Patent No. 5,400,040 to Lane (henceforth, Lane). The Examiner rejected claims 14-19 and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over Trompower in view of U.S. Patent No. 6,049,533 to Norman *et al.* (henceforth, Norman). The Examiner rejected claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Trompower in view of U.S. Patent Appl. Pub. No. 20020181485 to Cao (henceforth, Cao). Applicants respectfully request reconsideration in light of the following remarks.

Claim 1 provides a wireless communication system including a plurality of access points each having at least one omnidirectional antenna forming a substantially uniform coverage area around the access point. The system also includes a plurality of subscriber units each having at least one directional antenna forming a directional coverage area. The directional coverage area is selectable from a plurality of directional coverage areas provided by the subscriber unit.

The Examiner rejected claim 1 as an obvious combination of Trompower and Hagerman. The Examiner admits that "Trompower fails to show the subscriber unit having a directional antenna, the directional coverage are [*sic*] selectable from a plurality of directional coverage area provided by the subscriber unit." To make up for this lack of disclosure in Trompower, the Examiner proposes Hagerman, providing only the following argument:

> However, Hagerman the subscriber unit having directional antenna, the directional coverage are selectable from a plurality of directional coverage area provided by the subscriber unit (see figs. 1-6, col. 2, lines 3-67, col. col. 3, lines 1-19, col. 4, lines 1-col. 5, line 22 and col. 12, lines 15-15).

The Examiner is wrong about the disclosure of Hagerman. Hagerman discloses base stations with directional coverage, not subscriber units with directional coverage, as indicated in many places throughout Hagerman.

When embodied, e.g., ***in a radio base station of a cellular communication system, directional antenna beam patterns are formed*** during successive time slots defined upon a carrier at least to transmit communication signals to selected mobile terminals. The antenna beam patterns are formed to be of configurations not only to reduce mutual interference with communication signals communicated with other mobile terminals but also to permit other mobile terminals to make use of the portions of the communication signals transmitted to the selected mobile terminals.

Hagerman, col. 1, ll. 21-30 (emphasis added).

***By forming the directional antenna beam pattern, the power of a downlink transmission communicated by the radio base station to the mobile terminal is directed towards the mobile terminal.*** Thereby the transmission range of the radio base station is increased and the possibility that communication of the downlink transmission might interfere with other communications in the cellular communication system is reduced. Analogously, the directionality of the antenna beam pattern reduces the levels of interference of uplink transmissions received by the radio base station on an uplink channel. The sensitivity of the uplink channel is thereby also improved.

Hagerman, col. 2, ll. 36-47 (emphasis added).

Capacity can also be increased by permitting more than one mobile terminal to communicate upon a single traffic channel within a single coverage area due to the directional nature of the antenna beam patterns which can be formed, communications can be effectuated with a first mobile terminal utilizing one antenna beam pattern and with a second mobile terminal utilizing a second, non-overlapping antenna beam pattern. ***That is to say, two or more antenna beam patterns can be formed to extend in different directions to permit communications with mobile terminals positioned in different locations within a cell.*** A two-fold or greater capacity increase in communication capacity over that of a conventional communication system is possible in such an arrangement.

Hagerman, col. 2, ln. 63-col. 3, ln. 9 (emphasis added).

To permit the requirements set forth in the operational standards of various cellular communication systems to be met, ***a radio base station utilizing directional antenna apparatus*** must be operable in a manner to permit appropriate information to be detected by mobile terminals other than mobile terminals to which downlink transmissions are to be directed.

Hagerman, col. 3, ll. 57-63 (emphasis added).

***When operative at, for example, a radio base station of a cellular communication system utilizing a TDMA communication scheme, directional antenna beam patterns are formed*** during successive time slots defined upon a carrier at least to permit transmission of communication signals to selected mobile terminals. Because the antenna beam patterns are directional, communication of downlink transmissions by the radio base station to a selected mobile terminal is less likely to cause interference which adversely affects communications with other mobile terminals. And, because of the directional nature of the antenna beam patterns, uplink transmissions generated by the selected mobile terminal are received by the radio base station with lessened levels of interference introduced thereupon.

Hagerman, col. 4, ll. 16-29 (emphasis added).

FIG. 2 illustrates an exemplary manner by which beam forming techniques can be utilized in a cellular communication system utilizing a TDMA communication scheme. The figure illustrates the generation of antenna beam patterns during three time slots 12 formed to facilitate the transmission of downlink signals by a radio base station 18 or receive uplink signals transmitted thereto. ***The base station 18 includes antenna apparatus capable of forming directional antenna beams to communicate communication signals between the base station 18 and a plurality of mobile terminals operable in a cellular communication system*** upon different channels defined upon the different time slots 12.

Hagerman, col. 7, ll. 56-67 (emphasis added).

Operation of the various embodiments of the present invention ***form directional antenna beam patterns by which downlink transmissions are communicated by a radio base***

> ***station to a selected mobile terminal***. Communications effectuated by way of such antenna beam patterns are less likely to cause interference which adversely affects communications with other mobile terminals. Because of the directional nature of the antenna beam patterns, uplink transmissions generated by the selected mobile terminals are received by the base station with lessened levels of interference introduced thereupon. The channels are allocated for the communication of the communication signals between the radio base station and the mobile terminals in manners also to facilitate the detection by other mobile terminals of downlink transmissions by the radio base station.
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> Hagerman, col. 14, ll. 15-18 (emphasis added).

Neither Trompower nor Hagerman teach or fairly suggest Applicants' subscriber units having at least one directional antenna forming a directional coverage area. There is no reason to believe that Hagerman's base station antenna, however it operates, can be modified to work in Applicants' subscriber units. Moreover, there is no suggestion in either Trompower or Hagerman to modify a base station antenna for use with Applicants' subscriber units. Claim 1 is patentable over any combination of Trompower and Hagerman. Claims 2-13, which depend from claim 1, are therefore also patentable.

Independent claim 31 provides a method of communicating. A plurality of access points, each access point having an omnidirectional antenna, is established. A channel is established between one of the access points and one of a plurality of subscriber units by selecting one of a plurality of antenna directions in the subscriber unit, the selected antenna direction implementing a directional antenna. Information packets are transmitted in a uniform coverage area around each access point. Information packets are received at each access point transmitted from the directional antenna.

The Examiner rejected claim 31 using the same argument as for claim 1. While Applicants note that claim 31 has a different scope than claim 1, the reasons provided above for the patentability of claim 1 apply to claim 31 as well. Claim 31 is therefore patentable over any combination of Trompower and Hagerman.

Independent claim 14 provides a method of wireless communication. Downlink information is transmitted in a substantially uniform coverage area around each of a plurality of access points. The downlink information is received at a subscriber unit. Uplink information is transmitted in a focused coverage area from the subscriber unit. The uplink information is received at one of the access points. Information is routed between the access points by receiving the information in a distribution point and sending the information to an access point in communication with the distribution point if the information is destined for a subscriber unit in communication with the access point, otherwise forwarding the information to another distribution point in communication with the distribution point.

The Examiner rejected claim 14 as an obvious combination of Trompower and Norman. Claim 14 provides for subscriber units transmitting uplink information in a focused coverage area. The Examiner asserts that this limitation is disclosed in Trompower, stating only "see fig. 6A, col. 1, lines 55-60, col. 5, lines 40-46." The first passage cited by the Examiner is reproduced as follows:

> The shape of each cell is primarily determined by the type of antenna associated with a given base station. For instance, base stations which communicate with mobile terminals often have omnidirectional type antennas which provide for generally circular shaped cells and allow for a wide area of coverage.

This passage discloses a base station broadcasting in an omnidirectional pattern. No mention is made of how a subscriber unit responds. The second passage cited by the Examiner is reproduce as follows:

> The present invention includes an apparatus and a process for enhancing the performance capabilities of a cellular communication system. The cellular communication system of the present invention includes a plurality of mobile terminals and a plurality of base stations. The base stations may be connected to a hardwired network backbone or serve as wireless base stations. Each base station can transmit and receive data in its respective cell.

Once again, there is no discussion relating to how a subscriber unit responds.

The Examiner also cited Trompower's Figure 6A, without providing any reference numbers or any citation to text explaining how the Examiner believes this Figure

discloses Applicants' subscriber units. Figure 6A, as explained in Trompower, discloses that the base stations, and not the subscriber units, may have a "yagi type directed antenna."

> As an illustrative example of a cellular communication system in accordance with this invention, FIG. 6A shows a mobile terminal 230 communicating with a device on the system backbone 260. The mobile terminal is registered to a wireless base station 215 which has formed a permanent link to the system backbone through base station 210. Both the wireless base station 215 and the hardwired base station 210 have the ability to dynamically alter parameters such as modulation complexity, PN code length, and/or chipping rate in order to optimize data transmission as discussed above. The wireless base station 215 increases the geographic area in which the mobile terminal 230 can travel and still maintain contact with devices on the system backbone 260. In order to further increase the distance from which the wireless base station 215 can communicate with the base station 210, an omnidirectional type antenna is directed toward the base station 210. ***In other embodiments, the two antennas could be attached to the wireless base station, wherein one antenna is a yagi type directed antenna for communicating with the hardwired base station, and a second antenna is a omnidirectional type antenna for receiving and transmitting to the mobile terminal 230.*** Although only one wireless base station 210 is shown to act as an intermediate link between the mobile terminal 230 and the base station 210, it should be appreciated that several wireless base stations 210 could be used in a row to further extend communicating range.
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> Trompower, col. 25, ln. 65-col. 26, ln. 24 (emphasis added).

Trompower neither teaches nor fairly suggests a subscriber unit transmitting uplink information from a subscriber unit in a focused coverage area. Norman also fails to teach or fairly suggest Applicants' subscriber unit. Claim 14 is patentable over any combination of Trompower and Norman. Claims 15-19 and 22-28, which depend from claim 14, are therefore also patentable.

Independent claim 29 provides, *inter alia*, a wireless communication system including a plurality of subscriber units, each of which transmits information packets over a focused directional coverage area. The Examiner rejected claim 29 as an obvious combination

of Trompower and Cao. The Examiner relied on Trompower for disclosing Applicants' subscriber units, providing as support only "see fig. 6A, col. 1, lines 55-60, col. 5, lines 40-46 and fig. 2, col. 9 lines 22-67 and col. 10, lines 1-10." The first three citations, as discussed above, do not teach or fairly suggest Applicants' subscriber units. Figure 2 illustrates base stations communicating with each other using directional antennas. The passage spanning columns 9 and 10 discloses that "each wireless base station 215 is shown to have connected to it both an omnidirectional antenna 290 and a yagi type directed antenna 292." (Col. 9, ll. 22-24.) However, the only antenna type disclosed for Trompower's mobile terminals is "an omnidirectional antenna." (Col. 9, ll. 60-61.) The Examiner's second reference, Cao, also fails to teach or fairly suggest Applicants' subscriber units. Claim 29 is therefore patentable over any combination of Trompower and Cao.

Claims 1-19, 22-29 and 31 are pending in this application. Applicants believe these claims meet all requirements for patentability and respectfully request that this case be passed to issuance. No fee is believed due by filing this report. However, any fee due may be withdrawn from Deposit Account No. 21-0456 as specified in the Application Transmittal.

The Examiner is invited to contact the undersigned regarding any aspect of this case.

Respectfully submitted,

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